



Spectral Gamma-Ray Borehole Log Data Report

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Borehole

50-11-07

Log Event A

Borehole Information

Farm : <u>T</u>	Tank : <u>T-111</u>	Site Number : <u>299-W10-152</u>
N-Coord : <u>43,305</u>	W-Coord : <u>75,757</u>	TOC Elevation : <u>673.00</u>
Water Level, ft : <u>0.2</u>	Date Drilled : <u>2/28/1975</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.237</u>	ID, in. : <u>4</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>91</u>	
Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>94</u>	

Cement Bottom, ft. : 94 Cement Top, ft. : 0

Borehole Notes:

Borehole 50-11-07 was originally drilled in February 1975 and completed to a depth of 94 ft using 6-in.-diameter casing. In 1980, the original 6-in. casing was perforated from 0 to 20 ft and 92 to 94 ft. A 4-in. casing was placed inside the 6-in. casing and 109 gal of grout was added to the annulus.

An exact casing correction factor is not available to match the actual field conditions for this borehole; therefore, a 0.5-in.-thick casing correction factor was used to analyze the data. Use of this casing correction factor will cause the radionuclide concentrations to be underestimated.

The top of the casing, which is even with the ground surface, is the zero reference for the SGLS.

Equipment Information

Logging System : <u>2B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency : <u>35.0 %</u>
Calibration Date : <u>10/1997</u>	Calibration Reference : <u>GJO-HAN-20</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>01/22/1998</u>	Logging Engineer: <u>Jim Coates</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>52.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>2</u>	Log Run Date : <u>01/23/1998</u>	Logging Engineer: <u>Jim Coates</u>
Start Depth, ft.: <u>51.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>90.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Logging Operation Notes:

This borehole was logged in two log runs. The total logging depth achieved by the SGLS was 90.5 ft. This borehole was logged with the SGLS operating in the move-stop-acquire mode, stopping every 6 in. and collecting spectra data for 200 s.

At the time of logging, this borehole was filled to the ground surface with water.

Analysis Information

Analyst : R.R. Spatz

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 09/09/1998

Analysis Notes :

The pre- and post-survey field verification spectra for all logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging.

The casing correction factor for a 0.50-in.-thick steel casing was applied to the concentration data during the analysis process because this correction most closely matches the double casing. A grout correction was not made because none is available; a water correction was not applied because none is available for a 4-in.-diameter borehole. Use of this casing correction factor will cause radionuclide concentrations to be underestimated.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Results/Interpretations:

The radionuclide concentrations identified are only apparent concentrations and should be considered underestimated.

The only man-made radionuclide detected around this borehole was Cs-137. Cs-137 contamination was detected at the ground surface at 0.15 pCi/g and continuously from 3 to 6 ft at concentrations ranging from 0.25 to 0.4 pCi/g. A single detection of Cs-137 contamination occurs just above the MDL at 84 ft. The maximum Cs-137 concentration for this borehole was 0.4 pCi/g detected at 5 ft.



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The K-40 concentrations increase from a general background of about 9 pCi/g above 39 ft to about 12 pCi/g between 39 and 55 ft. Below 79 ft, the K-40 concentrations decrease to about 11 pCi/g. The concentrations of U-238 and Th-232 increase below 82 ft.